

# 移动技术在中国大学图书馆的应用

***Mobile Technologies in China University Libraries***

姜爱蓉  
Jiang Airong

清华大学图书馆  
Tsinghua University Library

May 29, 2014 • HONGKONG

# 提纲 outline

- 移动技术**引领**的新一轮浪潮

The new wave led by mobile technology

- 移动技术**推动**的进步与变革

Progress and changes promoted by mobile technology

- 移动技术**驱动**大学图书馆服务创新

Mobile technology driven service innovation in Univ. Libraries

- 结语

Conclusion

# 移动技术引领的新一轮浪潮

The new wave led by mobile technology

现今，互联网正在进入前所未有的巨融合时代。

The Internet has entered an unprecedented era of blending



移动互联网正在以一种不可抗拒的方式潜入人们的掌心，从电视到电脑，从电脑到口袋。

**The mobile Internet** slips into people's hands in an inevitable way, from TV to computer, and from computer to pocket PC.

可穿戴设备的出现更是标志着信息技术对人类文明的新一轮推进。

The appearance of **wearable devices** further marks the effects of IT industry on the promotion of human civilization.

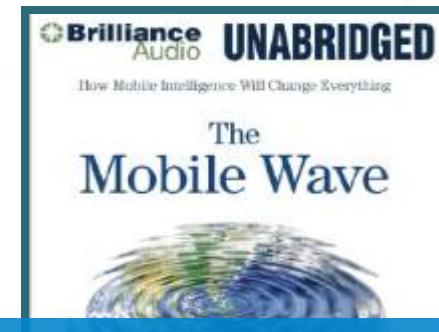
# 《移动浪潮：移动智能如何改变世界》

**The Mobile Wave: How Mobile Intelligence Will Change Everything**

— 【美】迈克尔·塞勒 (Michael Saylor)

- **农业革命**把人类从游牧部落变成城市居民，并为诸如希腊和罗马等大城邦的兴起奠定了基础。
- **工业革命**带来我们今天所看到的现代机械化经济。
- **信息革命**开始于15世纪的印刷术，但直到20世纪60年代，随着电脑科技出现，信息革命才开始加速影响社会。
- 移动计算技术将成为信息革命推动社会剧变  
移动技术是为信息革命带来突破的“引爆点技术”

Mobile technology is the “tipping point technology” that can bring breakthrough to information revolution



移动浪潮的出现与技术的巨大变化有关。信息和通讯技术（ICT）的发展已达到规模应用和广泛普及的成熟度，正在成为21世纪社会发展和世界经济增长最强有力的动力。在一些发达国家，**ICT产业对GDP的贡献率高达30%～40%**。

高速互联网、无线通信、数据服务、移动终端等技术的进步和成熟促成现今移动技术走进大规模应用时代。  
The progress and maturity of high-speed Internet, wireless communications, data service and mobile devices push the mobile technology enter the era of large-scale applications.

## 2014年ICT深度观察大型报告会

暨2013年十大关键词、2014年十大趋势发布仪式

## 移动技术迅猛发展 Rapid development in mobile technology:

- 以太网速率从10M,100M,1000M到10G, 以10倍增长；

The speed of Internet is increased from 10 megabytes, 100 megabytes, 1000 megabytes, to 10 gigabytes, at the rate of 10 times each;

- 3G、4G网络广泛应用，WiFi普及进家庭、覆盖到城市；

The 3G and 4G network are broadly used. WiFi is spread in families, and is covered in cities;

- 移动终端井喷式增长且智能化功能快速提升。

The number of mobile terminals has increased enormously, and intellectualized functionalities have been improved rapidly.



4年



随着三大运营商启动4G网络建设，中国将在2014年建成全球最大的4G网络，成为全球最大的4G市场之一

With the construction of 4G network by three big mobile carriers,

2009年1月中国工信部颁发3G牌照

2013年12月中国工信部颁发4G牌照

China will have the biggest 4G network in world.

● 截至2013年底，全球移动用户数达67.5亿，普及率达94.1%。

By the end of 2013, the number of mobile users worldwide reached 6.75 billion, and the popularizing rate is 94.1%.

● 截至2013年底，中国移动用户数达12.3亿，连续5年增超1亿。

已成为全球最大移动通信市场且持续保持高速发展势头。

By the end of 2013, the number of mobile users in China reached 1.23 billion, and increased by 100 million each year for continuous five years. China has become the biggest mobile market in the world and is keeping the trend of rapid development.

● 截止2013年底，中国手机网民数量达5亿，占整体网民总数的81%。

By the end of 2013, the number of mobile Internet users reached 5 hundreds million, occupying 81% of the overall total number of Internet users in China.



近7年手机网民规模和网民比例发展情况

	全面提速阶段 ( 2013 年底 )	推广普及阶段 ( 2014-2015 )	优化升级阶段 ( 2016-2020 )
固网宽带	>2.1 亿户	>2.7 亿户	>4 亿户
	城市用户 20Mbps 达 80%; 农村用户 4Mbps 达 85%	城市用户普及 20Mbps 发达城市 100Mbps; 农村用户全面实现 4Mbps	城市和农村家庭宽带接入能力分别达到 50Mbps 和 12Mbps; 50% 的城市家庭用户达到 100Mbps, 发达城市部分家庭用户可达 1Gbps;
3G/LTE	>3.3 亿户	>4.5 亿户	>12 亿户
城市公共区域无线热点覆盖	基本实现	全面覆盖	全面覆盖
有线电视网	互联互通平台覆盖 用户比例达 60%	互联互通平台覆盖 用户比例达 80%	互联互通平台覆盖 用户比例达 95%

## “宽带中国”发展目标与时间表

Development goals and timetable of “Broadband China”

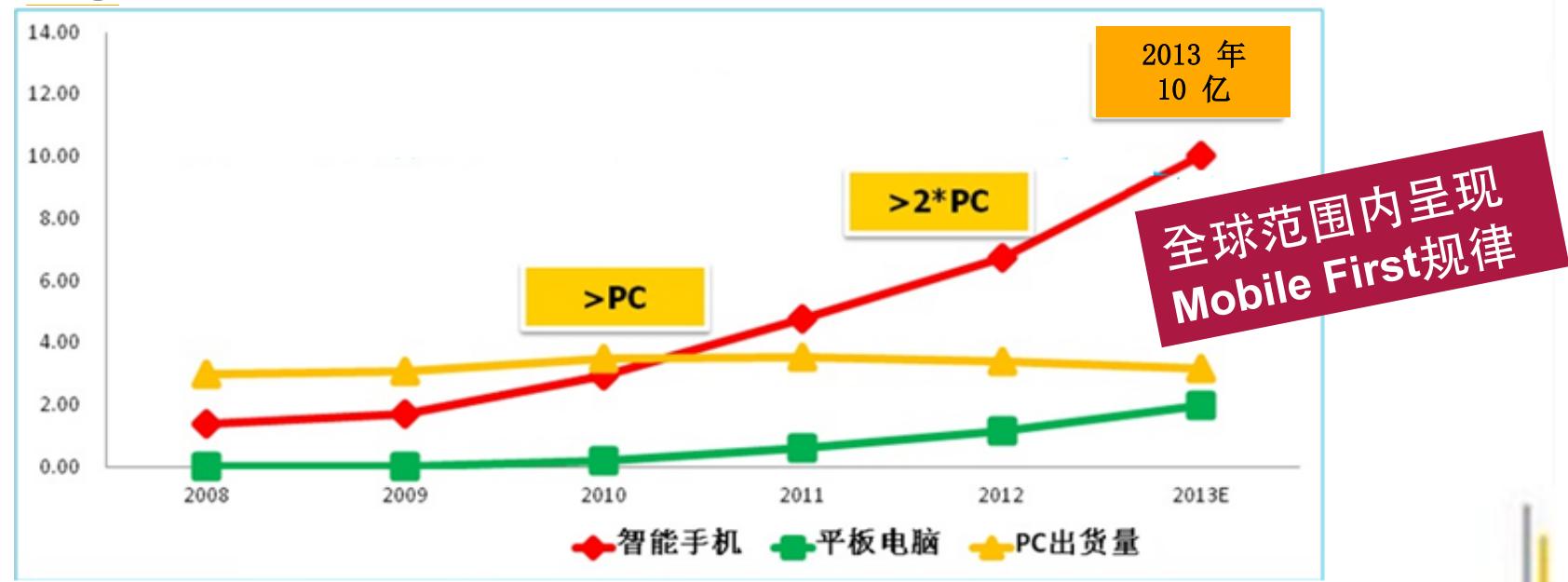
软硬件快速发展使移动智能终端具备了融合多领域技术的能力.

The rapid development of software and hardware makes the mobile devices being able to merge technologies from multiple areas.

全球范围内，移动智能终端出货量在2011年超越PC，2012年2倍于PC，2013年达10亿部出货规模。

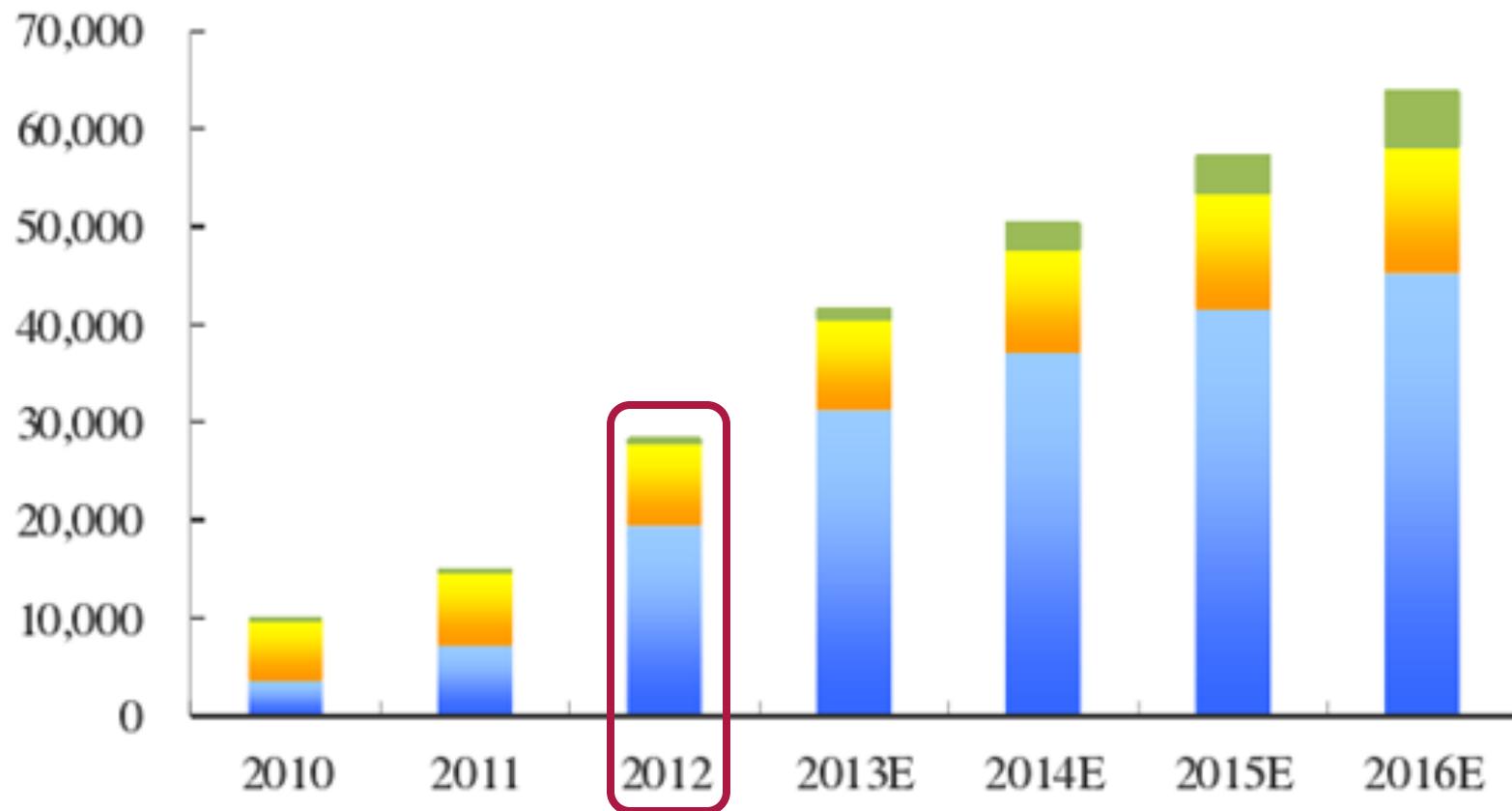
Worldwide, the volume of mobile devices shipment run over PC in 2011, became two times of PC in 2012, and achieves 10 hundreds million in 2013.

全球 智能终端及计算机发展情况（亿部） 来源：Gartner



单位：万台

■ 智能手机 ■ PC ■ 平板电脑

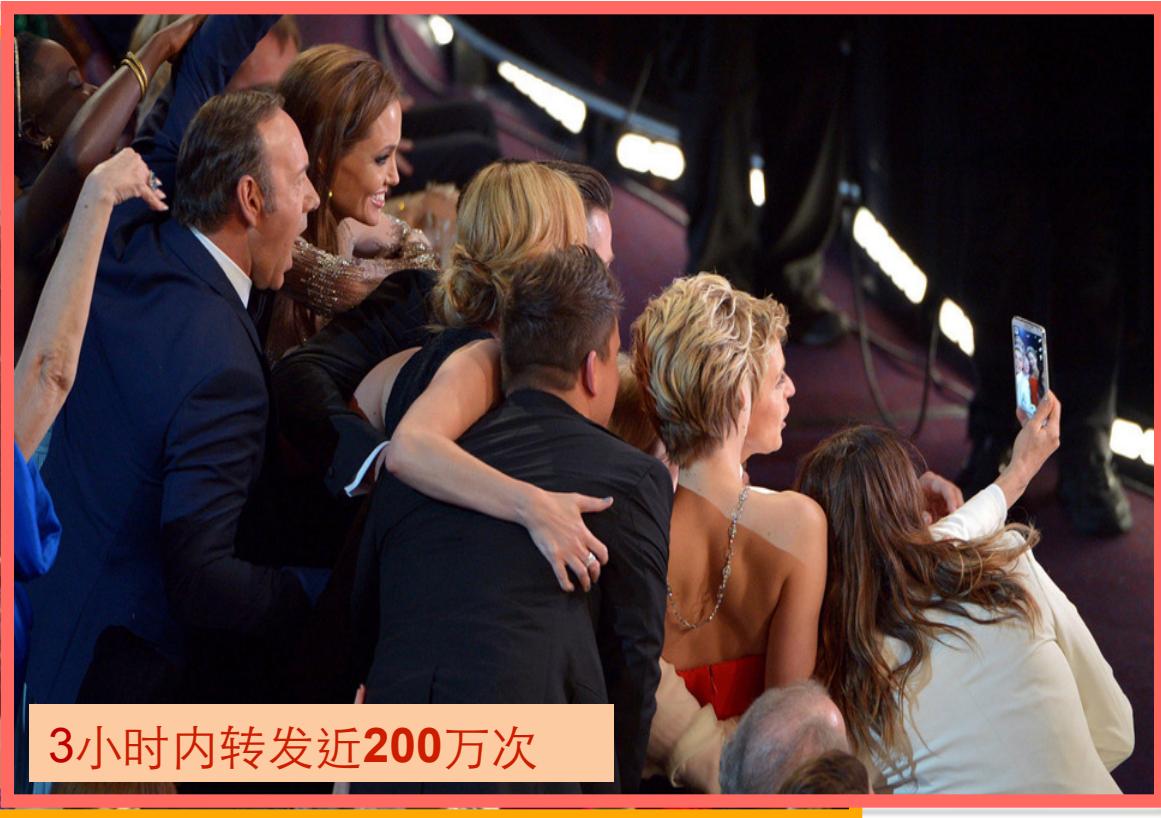


2010-2016年中国各类智能终端设备出货量预测

The prediction on volume of all types of mobile devices  
shipment in China from 2010 to 2016

在移动技术时代，智能手机是人们手中的“瑞士军刀”，其优势不是各种功能都做到极致，而是便携和易用。自从智能手机普及以来，多种单一功能的设备纷纷被取代，相机是最为典型的一种。

In the era of mobile technology, smartphone is people's "Swiss army knife". Its advantage is not making each functionality extremely good, but is easy to carry and use. Since smartphones are widely used, many single functional devices have been replaced. Camera is the most typical example.



3小时内转发近200万次

● 智能手机的功能日益强大，正逐步替代照相机、现金支付、地图、远程控制设备、掌上游戏机、登机牌、门票、现金出纳机、计算器、记事本、指南针等。

The functionality of smartphone becomes increasingly stronger, and smartphone gradually replaces camera, cash payment, map, remote control device, handheld game console, boarding pass, entrance ticket, cash register, calculator, notebook, compass, and so on.

《时代周刊》调查发现，1/4 的人每隔 30 分钟看一次手机，1/5 的人每隔 10 分钟看一次手机。1/3 的受访者坦承，即使短时离开手机也会产生焦虑感。不断地吸纳新闻、信息和无聊废话已成为一种生存方式，很多人午餐时也会至少看手机两次。**25~29岁的人群中，有3/4会拿着手机上床。**



移动智能终端的普及，大大加速了移动互联网的发展，人们在使用时间和频度上从PC端向手机端迁移的趋势越来越明显。

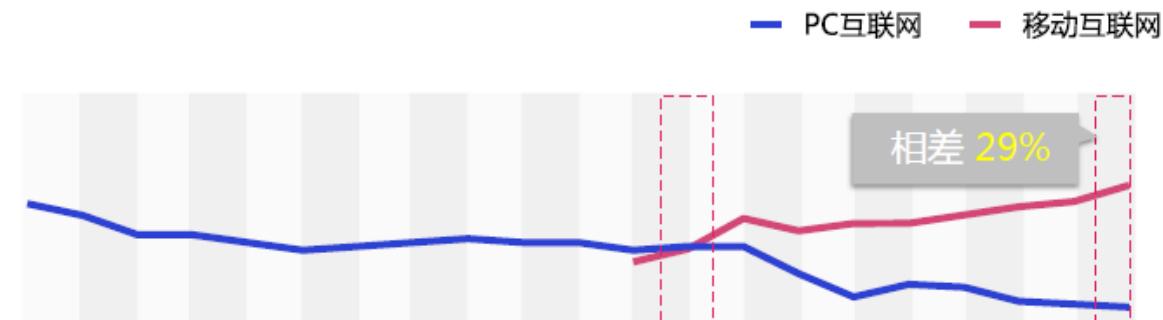
The popularity of mobile devices has greatly accelerated the development of mobile Internet. The trend of moving from PC to smartphone becomes increasingly obvious on people's use time and frequency.

## 移动互联网与PC互联网用户的人均上网时长差距不断扩大

2012年Q3首次超越PC互联网之后，

移动互联网的人均上网时长延续了快速增长态势。

截至2013年3月，两者的差距已经扩大到了29%。

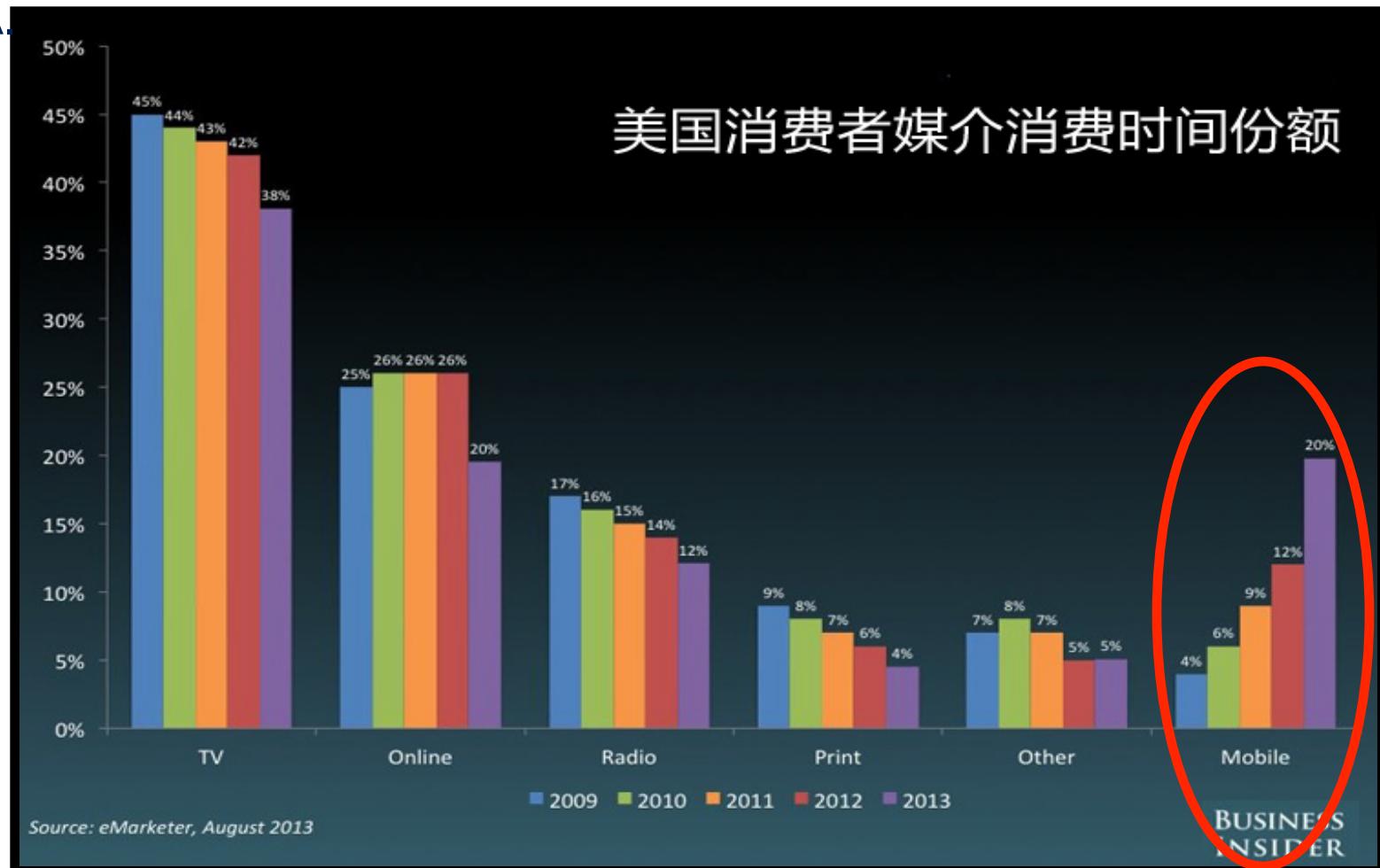


PC互联网向移动端迁移的趋势进一步加强。

## 未来智能终端成为互联网终端王者只是时间问题

In the future, becoming the king of Internet terminal is only a time problem to the mobile devices.

互联网流量消费中，超过1/5流量来自移动端。PC流量的占比开始下滑。移动媒体是近5年消费时间唯一保持增长的媒介。  
In the cost of Internet traffic, more than 1/5 comes from mobile terminals.  
The percentage of PC traffic begins to decrease. Mobile media is the only one that keeps increasing in time consuming in the recent five years in USA.



在计算机的发展历程中，移动技术时代是潜力最大，发展最为迅猛，竞争也是最为激烈的时代。

九十年代末期，全球个人电脑超过**1亿台**；世纪之交之际，接入互联网的电脑超过**10亿**；移动技术时代，接入移动互联网的装置将超过**100亿**（移动终端、智能家电、可穿戴设备）

In the history of development on computer, the era of mobile technology is the one with the greatest potential, the fastest speed, and the most intense competition.

At the end of 1990s, the amount of PCs was over one hundred million.

At the end of 20 century, the amount of computers accessed to the Internet was over ten hundreds million.

In the era of mobile technology, the amount of devices accessed to the Internet will be over ten billions (including mobile terminals, intelligent appliance, wearable devices and so on).

移动技术创造了巨大的挑战和机遇

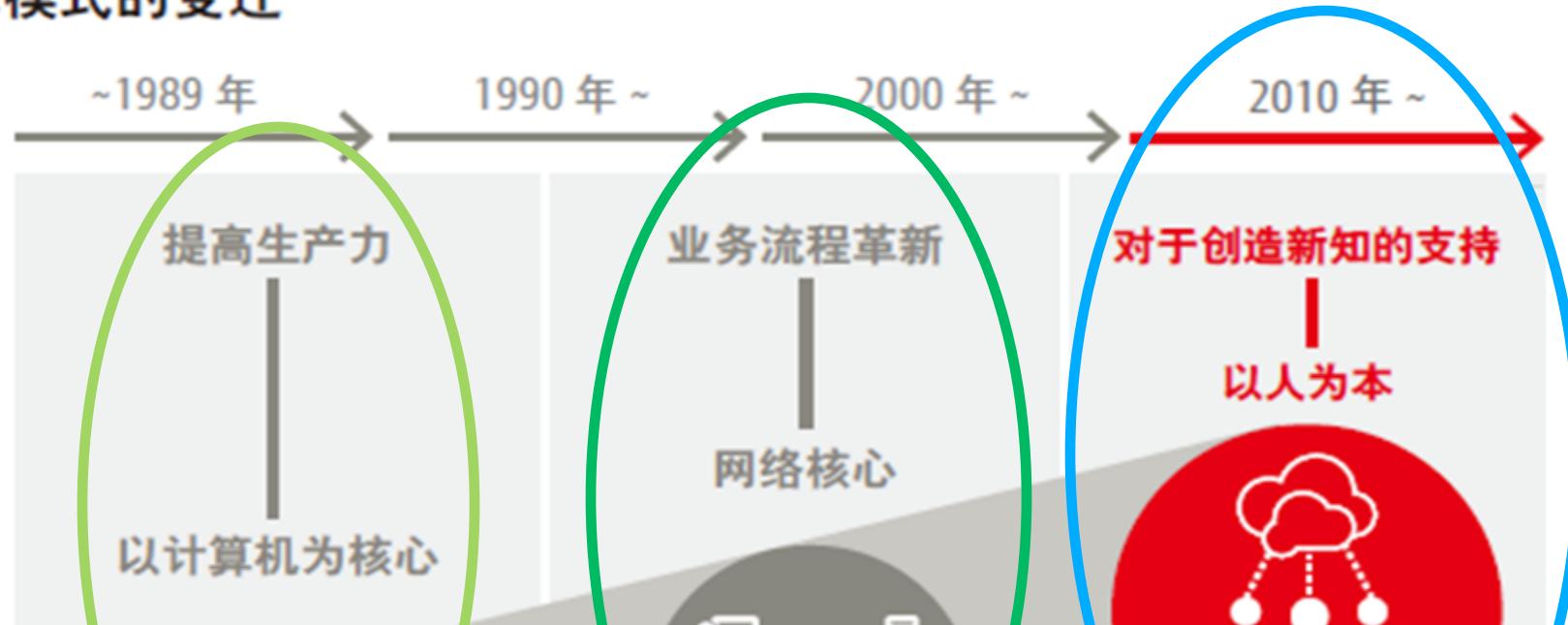
给各行各业、各个领域带来了新方式

Mobile technology creates great challenges and opportunities, brings new methods to all walks of life and all kinds of areas.

# 移动技术的发展日趋支持更人性化的活动

The development of mobile technology gradually supports humanized activities.

## 运算模式的变迁



与PC时代相比，移动互联网与智能终端更显以人为本，也更值得期待、应用和信赖。

Compared to the era of PC, the mobile Internet and mobile devices are more people-oriented, and are more worth being expected, used and trusted.

# 移动技术推动的进步与变革

Progress and changes promoted by mobile technology

# 移动互联网时代，正在发生的技术变革 ...

In Era of Mobile Internet, Technological Change is Happening ...

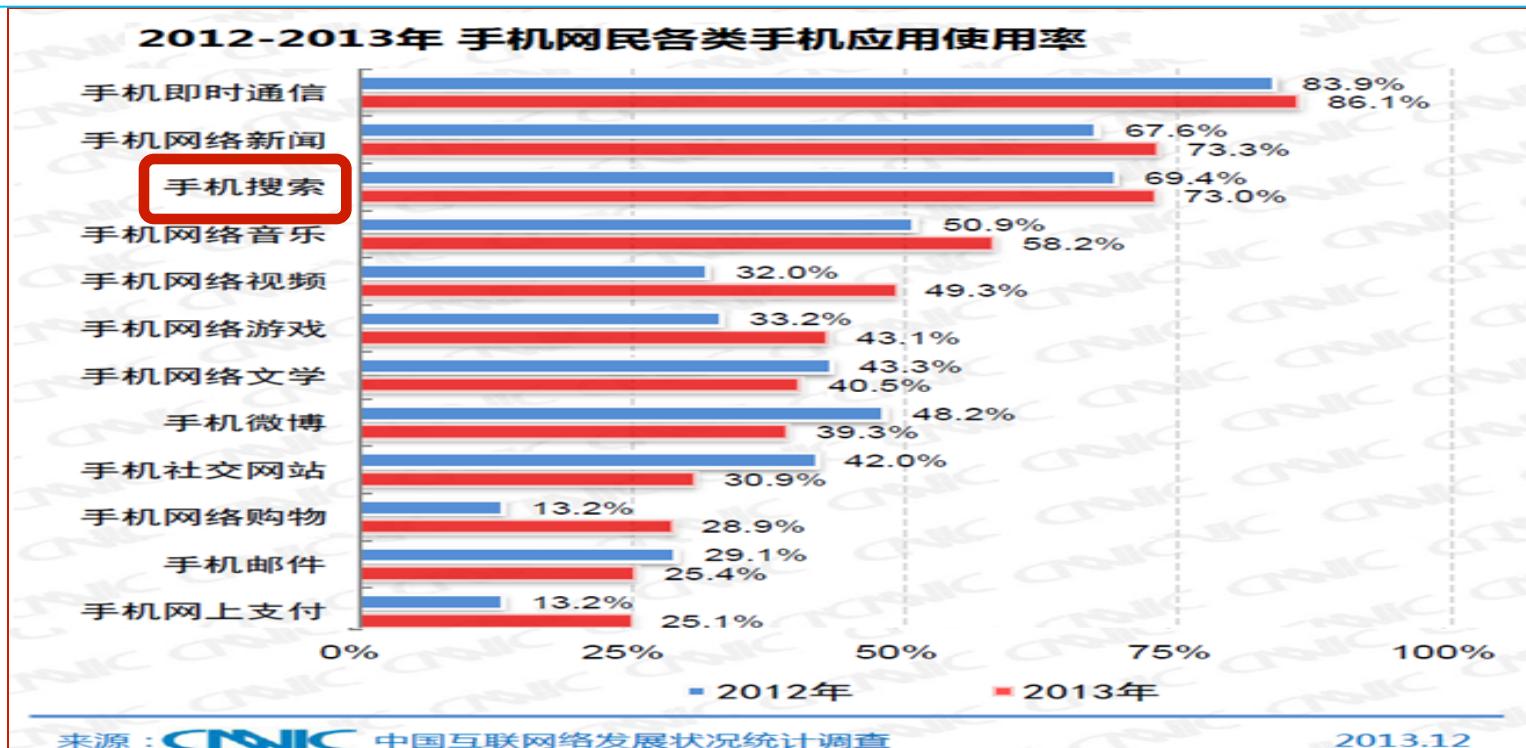
- 移动搜索 (Mobile Search)
- 响应式网页设计 (Responsive Web Design)
- 原生应用 Vs. **Web**应用 & 混合型应用  
(Native App Vs. Web App & Hybrid App)
- **HTML5** 的现实和传说  
(HTML5's Reality and Legend)
- 位置服务 (Location Based Services)  
.....

# ● 移动搜索 (Mobile Search)

中国互联网络信息中心(CNNIC)第33次报告显示：  
The 33<sup>rd</sup> report from CNNIC indicates that:

移动搜索作为信息获取的主流入口成为第三大手机应用，在上网人们的日常生活中占据着重要地位。

Mobile search, as the main input of information, ranks the third in smartphone applications, featuring prominently in people's daily life.



## 移动搜索与PC时代的搜索，不尽相同。

The mobile search and the search in PC era are not quite the same.

受限于移动设备，用户在移动端的搜索行为也在发生改变。移动搜索用户最迫切地是希望搜索引擎解决自己的即时需求，能快速直接的找到结果，而非是搜索引擎排列结果链接供用户选择。移动的新需求对搜索引擎提出新的考验。

Because of the limitation of the mobile devices, user's search behavior on mobile devices changes. Mobile search users is expecting the search engine to solve its own real time requirements, to find solutions fast and directly, but is not providing ranking results for users to choose.

## “需求的水位”驱动着搜索引擎变革

“The water line of requirement” motivates the revolution of search engine.

和PC端相比，移动端的信息存在诸多不同：

Compared to PC, information on mobile terminals has many differences:

1. 基于手机产生的信息越来越多，这些信息有更多新特性，如基于地理位置和本地服务等；

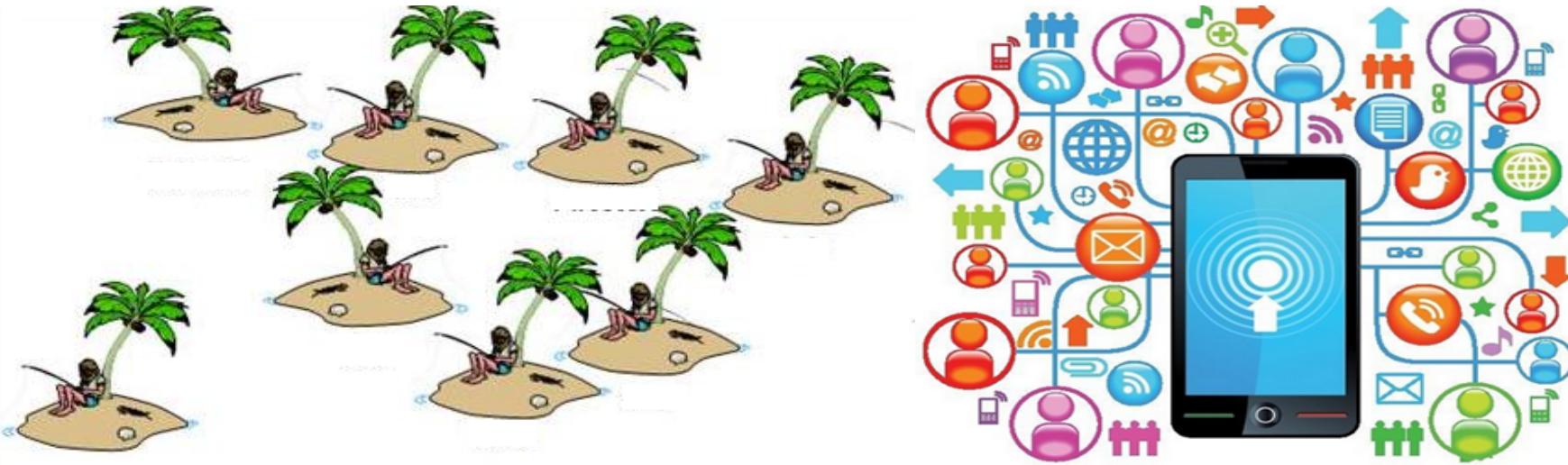
There are more and more information that is generated based on smartphone, and such information has many new characteristics, like location-based and local-service-based.

2. 移动互联网的多样性导致信息产生和组织方式发生巨大变化 — 信息被深深割裂开。很多信息藏在App中，分发渠道控制App。

The diversity of mobile Internet leads to the great changes in the way information is generated and organized --- information are cut apart deeply. Many information is hidden in APP, mobile app distribution by store.

3. 不断涌现的原生App（应用程序）带来的严重问题是信息孤岛。不同应用之间的数据很难共享，应用程序App正在从百万数量级迈向千万数量级，对应用程序App的**统一搜索**迫在眉睫。

Constantly emerged native Apps brings a serious problem: “information island”. Data among different Apps is hard to be shared. The amount of Apps is increasing from hundreds of thousands to tens of hundreds of thousands. The requirement of “unified search” for APPs is extremely urgent.



■ 传统PC搜索引擎 基于浏览器+搜索框 的搜索模式在移动搜索时代注定被削弱，Google的PC搜索量2012年开始下滑。移动搜索正在迅速成为人们寻找自己所需信息、服务、实体或虚拟商品的主要方式。

The search model of “browser plus search box” on traditional PC search engine is doomed to become weaker in the era of mobile search. The PC search amount of Google decreased since 2012. Mobile search is becoming the main method for people to find required information, services, physical or virtual goods.

■ 移动搜索活动正日渐脱离传统搜索引擎的生态系统

Mobile search activity gradually separates from the ecosystem of traditional search engine.

■ 语音搜索、图像搜索、地图搜索、二维码搜索、应用内搜索、社会化搜索 等多种新模式搜索正在出现。

Many new types of search emerge, like voice search, image search, map search, dimensional code search, search application, socialization search, etc.

# 精准性和个性化是移动搜索的大趋势

Accuracy and personalization is the general trend of mobile search.

■ 精准搜索以数据挖掘为前提，不仅用户搜索轨迹，还包括浏览、聊天等外部数据，接入外部数据越多越全面，越能挖掘出更精准答案。移动端具有地理位置、时间、用户等属性，为精准搜索和个性化推荐提供了更多的判断条件。

Because of adding attributes like location, time and user, mobile terminal provides more judging conditions for accurate search and personalized recommendation.

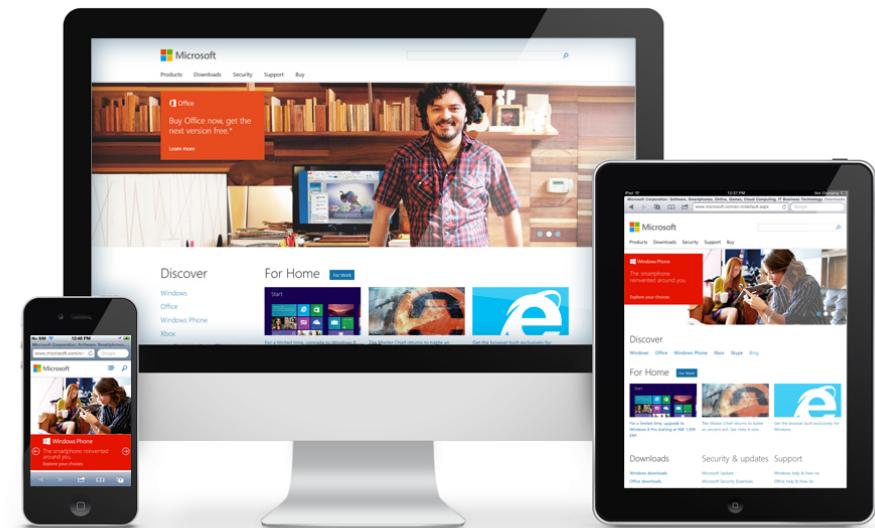
■ 移动搜索匹配每位用户在不同场景的真实需求，一对一对给出答案。

Mobile search matches each user's real requirements in different scenarios, and provides solutions on a one-to-one basis.

# 响应式网页设计 (Responsive Web Design)

The web design that can automatically identify the width of device screen and adjust accordingly.

美国著名网站设计师 伊桑-马科特 (Ethan Marcotte) 2010年提出的概念，指可以自动识别设备屏幕宽度、并做出相应调整的网页设计。也就是网站的每个网页能够自动适应不同大小的屏幕，根据屏幕宽度，自动调整布局 (**layout**) 、图片尺寸及相关脚本功能等。



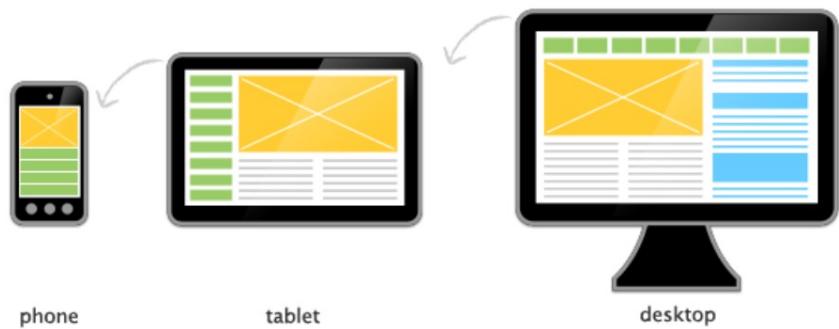
■ 新技术发展日新月异，移动智能终端的新尺寸层出不穷。

The development of new technology changes rapidly. The new size of mobile devices always emerges.

■ 如何让网站尽量兼容各种类型的设备，并确保良好的用户体验成为越来越重要的问题。

How to make the website to be compatible with all kinds of devices and guarantee good user experience, becomes a more and more important question.

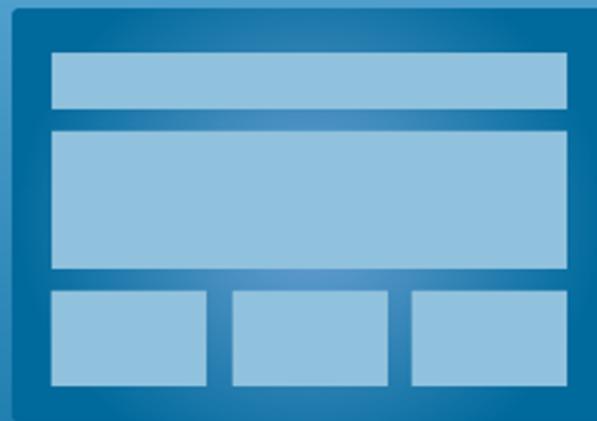
■ 采用RWD设计，无论使用哪种终端设备，用户可以与网站一直保持联系。



By using RWD design, no matter what kinds of terminal devices, user can always keep the access to website.

■ 在图书馆各个网站和资源平台都采用RWD设计之时，也许不再需要建立专门的移动图书馆网站，移动图书馆建设将更多致力于挖掘移动终端的特性，提供更便捷、更适用的图书馆服务。

When websites and resource platforms of library all use RWD design, the specific mobile library website may no longer be needed. The construction of mobile library will focus more on exploring the characteristics of mobile terminals, providing library services in a more convenient and practical way.



同一网址 One url  
同一内容 Single contents  
同一代码 One code



同一网站  
覆盖多终端

台式	Desktops
平板	Tablets
智能手机	Smartphones

# 原生应用 vs. Web应用 & 混合型应用

(Native App Vs. Web App & Hybrid App)

移动互联网时代，移动应用(**Apps**)井喷式增长。

In the era of Internet, the mobile APPs growth spurt.

- 现今全球大约3000多款手机，出货量较大的超过**1000**款。  
针对上千种移动终端做开发很难，应用碎片化，用户体验难保。  
Currently there are about 3000 kinds of cellphone worldwide, 1000 of them have large volume of shipment. It is very difficult to do software development according to thousands of mobile terminals. The fragmentation of APPs causes the lost of user experiences.

- 对用户来说，需要把原生 App 下载到自己的手机上，桌面被非常繁多的图标淹没，用户困扰。

For users, they need to download the native APPs to their own smartphone, so that the desktop is overwhelmed by many various icons, annoying them.

- 原生App的困扰促使Web App和混合型App应运而生。

The annoying from native Apps motivates the emergence of Web App and Hybrid App.

**原生应用**：通过各种应用商店安装，采用平台特定语言开发。

**Native APP**: installed by various APP stores, developed by specific platform languages.

**Web应用**：通过浏览器访问，采用**Web技术**开发。

**Web APP**: accessed by browser, developed by Web-based techniques.

**混合型应用**：通过各种应用商店安装，但采用**Web技术**开发。

**Hybrid APP**: installed by various APP stores, but developed by Web-based techniques.



## 开发技术比较 Comparison between different development techniques:

**Native App** → 优点是可完全利用系统的**API**和平台特性，在性能上也是最好的。缺点是各平台开发技术不同，需针对每个平台独立开发App，开发成本高。

The advantage is that it can fully use the system APIs and platform characteristics, and its performance is the best. The disadvantages is that its techniques are different among different platforms, which requires individual development of APPs for each platform, rising the development cost.

**Web App** → 优点是不同终端浏览器均可访问，一次开发多处分发(written once, run everywhere)。缺点是这些应用无法充分调用终端平台API实现一些高级功能。

The advantages is that browsers from different terminals can all visit, which we called “written once, run everywhere”. The disadvantage is that the APPs cannot call platform APIs to implement some advanced functionalities.

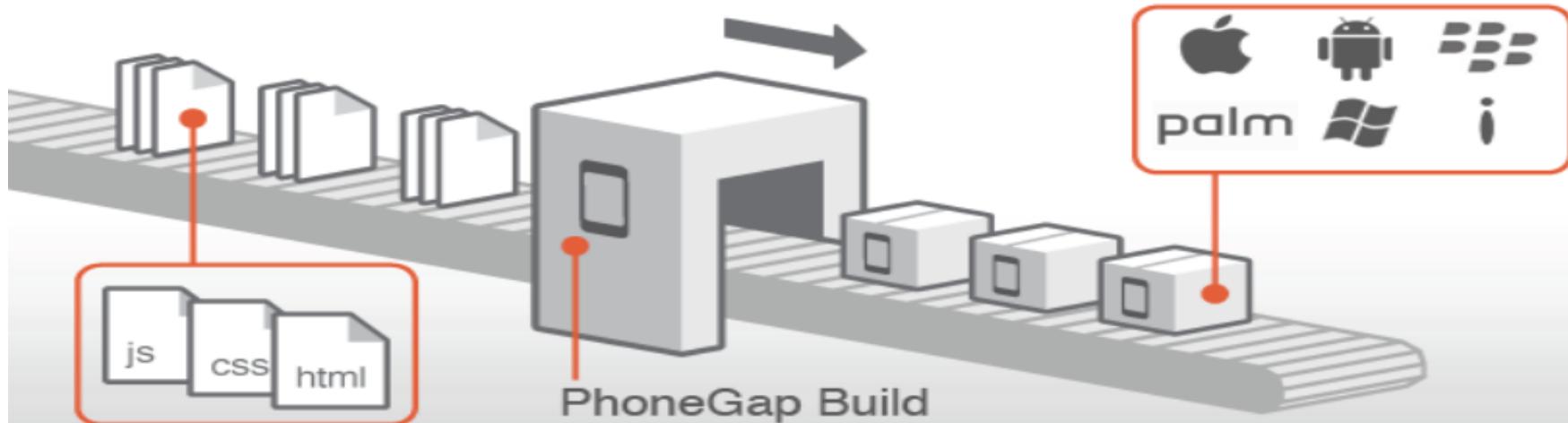
优劣对比	设备支持	复杂性	用户体验	语言	离线支持	设备特性使用
移动web应用	部分	中等	优良	HTML/CSS/ javascript	有限	有限
原生应用	所有	复杂	极其优秀	多种	支持	支持

**Hybird App** → 旨在弥补以上两者开发模式的缺陷，继承双方的优势。优点是已开发的应用程序只需针对不同平台进行编译就能实现在多平台的分发，开发效率高；标准化程度好，迭代更新容易。缺点是浏览体验还无法超越原生应用，复杂应用运行速度缓慢。

The advantage is that application only needs to be re-compiled for different platforms, no longer need to be re-written, achieving multi-platform distribution, high performance development, good standardization process, ease of iteration and update. The disadvantage is that the browsing experience still cannot win native APP, and the runtime speed for complex applications is slow.

**PhoneGap**是Hybird App目前框架的集大成者。

PhoneGap is the one that integrates current frameworks of hybrid APP.



# HTML5 的传说与现实 Legend and reality of HTML5

■ HTML5是新一代开放Web标准，已得到所有主流浏览器支持。

HTML5 is the new generation of open Web standard and already been supported by all mainstream web browsers.

■ 一种最广为流传的说法：

**HTML5最终将代替App，  
成为移动互联的未来。**

HTML5 will eventually replace APP,  
becoming the future of mobile network.



目前尚在发展→ 90% : 10%，有待更多的系统权限、API 等

Currently ongoing: 90%:10%, needs more system permissions, APIs, and so on.

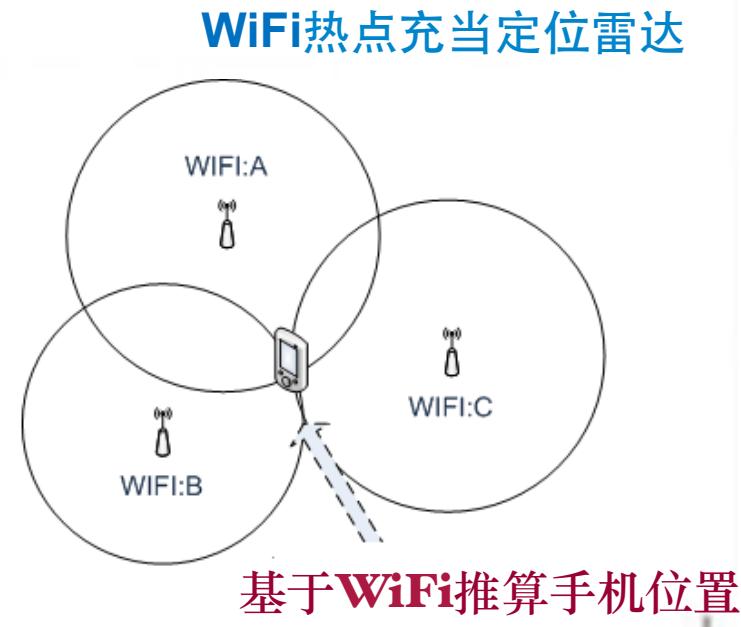
■ 越来越多应用采用“Native搭台、HTML5唱戏”的开发模式

becoming more development model of “Native builds the framework, HTML5 performs.”

# 位置服务 (Location Based Services , LBS)

- GPS : 人们对GPS的给力服务已是耳熟能详。GPS通过卫星信号测时测距（经纬度数据）实现全球导航/定位。
- LBS : 随着通信技术普及出现的LBS服务，通过移动通信基站信号差异计算移动终端位置，提供与位置相关的个性化服务。
- 近几年大热的室内定位技术，通过检测室内WiFi、蓝牙、RFID、LED等的信号强度和物理位置计算移动终端位置，提供基于室内位置的增值服务。

The recent popular indoor positioning technology measures the signal strength and location of indoor WiFi, Bluetooth, RFID, LED and so on to calculate the location of mobile terminal, and to provide the indoor-location-based value-added services.



# 室内定位技术的应用

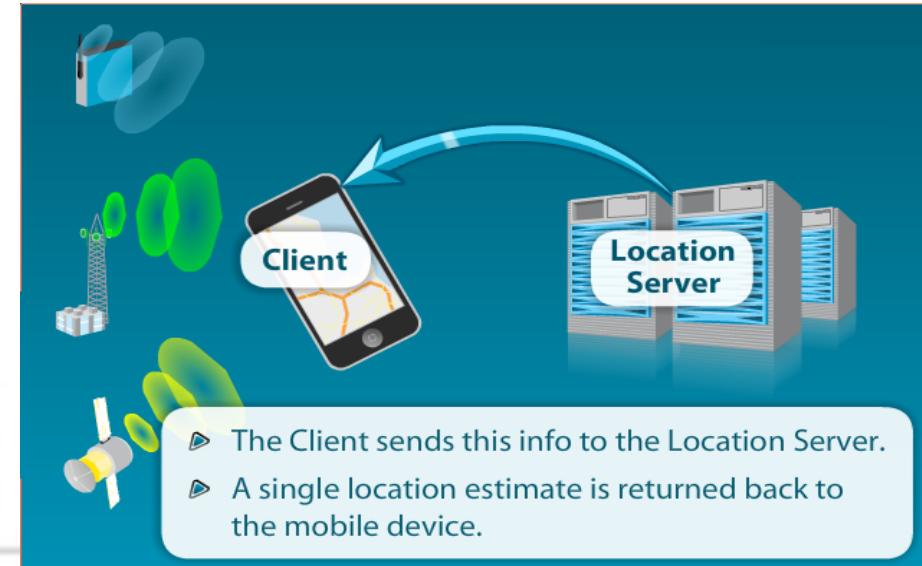
## Applications of indoor positioning technology

室内定位基站是**WiFi**接入设备。在基站周围根据距离、信号强度等建立指纹特征库。

移动终端出现在某区域时，同时扫描多个**WIFI**，系统检测每个**WiFi**热点的信号强度和唯一ID识别码，通过指纹数据库查到每个热点的坐标，从而完成定位。室内定位精度现在可以精确到米级，具有足够实用价值。



室内部署三个AP，就可以在一个点采集到三个信号强度值，形成一个指纹。



2013年3月，苹果斥资2000多万美元收购室内导航服务提供商**WifiSlam**; 2012年以来谷歌在全球10多个国家提供室内导航服务。索尼、诺基亚、三通、高通、博通等20多家厂商还联手成立了室内定位联盟(**In-Location Alliance**)，旨在推动室内定位技术及相关服务的创新和普及。

从技术成熟及大规模应用角度看，**WiFi**定位技术成为当前主流。其优势在于各类智能终端普遍有接入**WiFi**功能，随“宽带城市”的发展，各大城市公共区域和家庭已安装大量**WiFi**热点与网关，利用现有**WiFi**设施，可以显著降低建设与运营成本，快速实现室内LBS的应用普及。

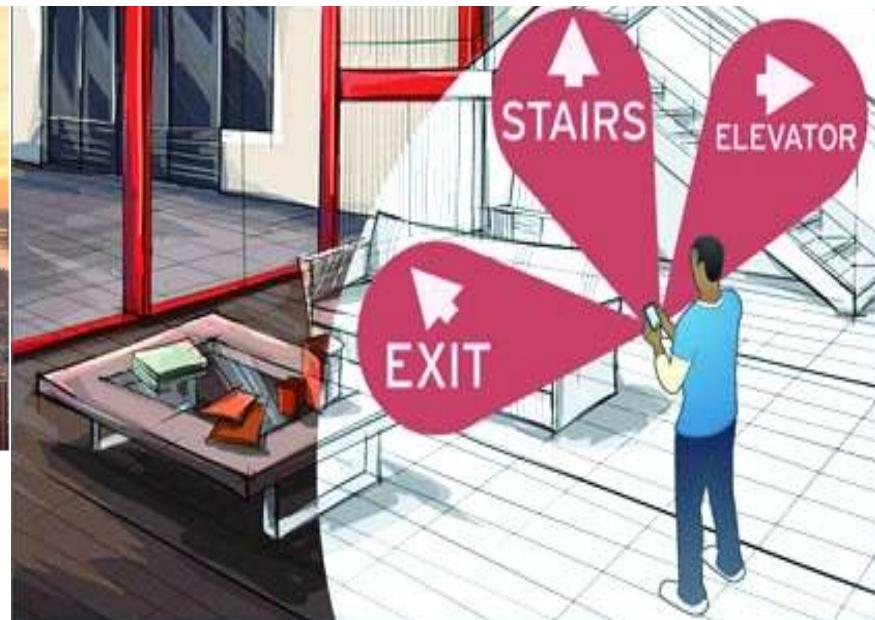
From the perspective of the large-scale applications, the WiFi location technology becomes the main stream. Its advantage is that various mobile terminals are able to access WiFi. With the development of “broadband city”, the public areas and families have been installed large amount of WiFi APs and gateways. By using current WiFi facilities, the cost of construction and management can be greatly decreased, achieving spreading of indoor LBS applications.

人类80%以上活动时间在室内，各种社会活动在室内比例更高。

80% time of people's activities happens indoor, with high rate of social activities and behaviors.

大型室内环境如购物中心、图书馆、博物馆、停车场、地铁换乘站、火车站、机场、写字楼等都有定位需求。

Large indoor environment, like shopping center, library, museum, parking lot, subway station, train station, airport, office building, all have the requirements of positioning.

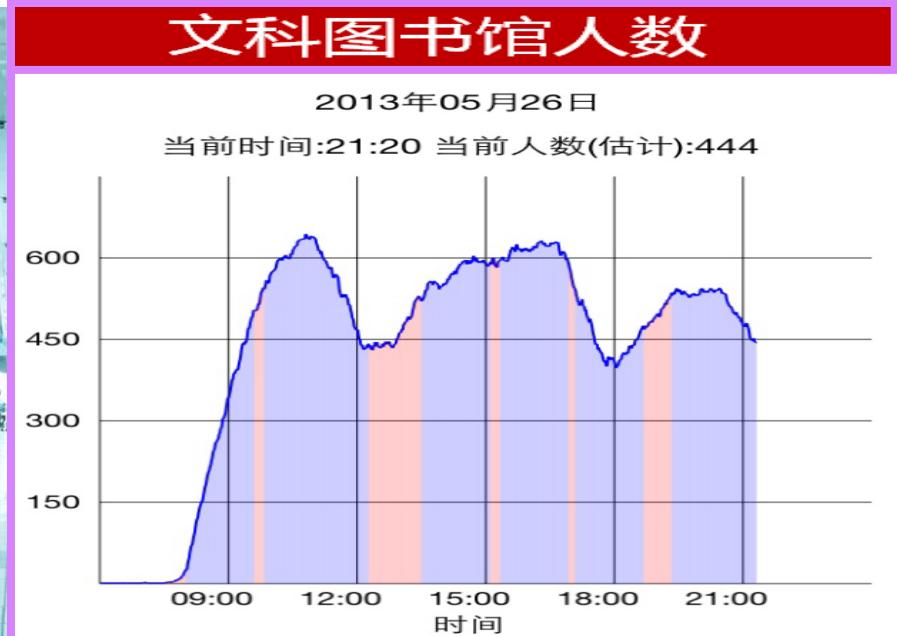


通过实时高精度定位，提供准确且快速的导引，大大降低寻找成本；根据室内位置推送及时有用信息，变革服务、提高效率。

By using real-time and high-accuracy positioning, we can provide accurate and fast navigation, greatly reduce the cost of searching. Based on user's indoor location to provide useful push information, we can innovative some services, improve service efficiency.

室内定位还提供用户流动分析工具，统计每个服务场所人流量、平均逗留时间，更好地了解用户和优化服务。

Indoor location also provides analyzing tools for user flow, which collects people throughput at each service place, average staying time, in order to better understand users and optimize services.



# 移动技术驱动大学图书馆服务创新

**Mobile technology drives service innovation in  
university library**

大学图书馆始终位于信息技术应用的前列，在移动技术的应用中也是如此。最近十年，中国大学图书馆的移动技术应用经历了3个发展阶段。

The university library has always ranked among the top areas of new technology applications, as well as mobile technology applications. In the last decade the mobile technology application in China university libraries has undergone three stages.

- 初期（2003~2007年），主要提供基于短信的移动服务，包括流通通知、各种公告和短信咨询服务；
- 中期（2008~2010年），增加了基于WAP的移动图书馆网站服务；
- 后期（2011年~~），增加了移动阅读服务、Apps应用以及体现移动终端特点的创新服务。

The initial stage is providing SMS-based mobile services, including circulation notification, various announcements and SMS consulting services. The medium stage is providing WAP-based mobile services. The later stage is providing mobile reading services, APPS services and some new services that can embody the characteristics of mobile devices

初步统计，在进入中国“211计划”的112所大学中，提供移动图书馆服务的比例超出95%。

In China, among 112 top universities in “211 Project”, currently more than 95% of them provide mobile library services.

移动图书馆获普遍应用，尤其受到学生读者青睐。

移动图书馆在大学教学、科研活动中的促进作用正在逐渐显现。

The mobile libraries play an active role in teaching and research activities in universities.



# 清华大学图书馆2006年开始探索移动图书馆应用

——两次获得社科基金项目的支持

Tsinghua Library began to explore the application of mobile library in 2006.  
We get twice supports from the National Social Science Found of China.

基于短信的服务 -- 量大、类多、普及

SMS-based service: large amount, multiple types, popularized

- 接收流通通知  
Send/receive circulation notification
- 短信OPAC查询  
SMS-based OPAC query
- 各类培训通知  
training notification
- 推送彩信报132种  
132 kinds of MMS push services
- 馆藏书目自助推送  
Library bibliography self-push service
- 研读间、座位预约提醒  
Appointment reminder service for research carrels and seat
- 常用服务联系方式查询  
Common service contacts query



# 彩信报推送服务 MMS Push Service

## 订阅表

USER	用户名
ISSN	期刊编号



选择	用户 jiangar 已订阅的期刊列表 (最多可订阅3种刊)
<input type="radio"/>	科学通报
<input type="radio"/>	清华大学学报 (自然科学版)
	<button>新增期刊</button> <button>删除</button>



选择	可供订阅期刊名称	期刊分类	收录情况
<input type="radio"/>	Tetrahedron letters	化学, 生命科学	SCIE, JCR
<input type="radio"/>	Tetrahedron	化学, 生命科学	SCIE, JCR
<input type="radio"/>	清华大学学报 (自然科学版)	工程学, 信息技术	EI, PKU, CJCR, CSCD
<input type="radio"/>	Journal of power sources	化学	SCIE, EI, JCR
<input type="radio"/>	Journal of materials science	材料科学与冶金, 工程学	SCIE, EI, JCR



132种读者高关注度的电子期刊  
132 kinds of highly concerned electronic journals

- 信息容量大 (短信70字, 彩信50KB)
- 传播内容形式丰富 (文字、图片、音乐)

# 馆藏书目自助推送 Library bibliographic self-push service

The screenshot shows the Tsinghua University Library Catalogue System interface. At the top, there is the library logo and name '清华大学图书馆 Tsinghua University Library'. Below the logo, there are several buttons: 'English Version', '图书馆主页', '馆藏目录', '重新开始', '保存当前记录', '以机读格式显示', '返回列表', '限定/排序', 'S+F+X', and '其他检索'. A dropdown menu labeled '(检索历史)' is open. Below these are search fields for '作者' (Author) set to '金旭亮', '全部馆藏' (All Collections), and a '系统排序' (System Sort) button. A checkbox for '限定在可出借馆藏中查询' (Limit to借阅able collections) is unchecked. The search results show '第5条记录, 共5条' (Record 5 of 5). The results list includes:  
主要责任者 金旭亮 jin xu liang 著  
题名 .NET 2.0面向对象编程揭秘 .NET 2.0 mian xiang duì biāng chéng jí mi / 金旭亮著  
出版发行 北京 : 电子工业出版社, 2007  
随书光盘: 在线运行 P2P下载 普通下载  
复本状态 更多细节 查找相似馆藏 完整显示 文本格式查看  
馆藏地/点 索书号 / 卷次 馆藏状态  
中文科技图书借阅区 (架位详图) TP393.09 T813 在架上 ->>发送短信  
中文科技图书借阅区 (架位详图) TP393.09 T813 在架上 ->>发送短信  
中文科技图书借阅区 (架位详图) TP393.09 T813 在架上 ->>发送短信  
信息服务中心(多媒体) (架位详图) TP393.09 T813 (1 CD) 馆内阅览 ->>发送短信  
信息服务中心(多媒体) (架位详图) TP393.09 T813 (1 CD) 馆内阅览 ->>发送短信  
信息服务中心(多媒体) (架位详图) TP393.09 T813 (1 CD) 馆内阅览 ->>发送短信

替代抄写索书条  
Replace Call Slip  
when finding book

The mobile phone screen displays a text message input field with the following text:  
使用说明: 此项服务对读者免费, 通讯信号正常情况下, 短信将于1分钟左右发送到指定手机上, 请耐心等待, 勿频繁提交, 感谢您的配合!  
手机号: \_\_\_\_\_  
馆藏信息: 流言 / 张爱玲,老馆社科库存本库,I266 Z073  
提交 重置

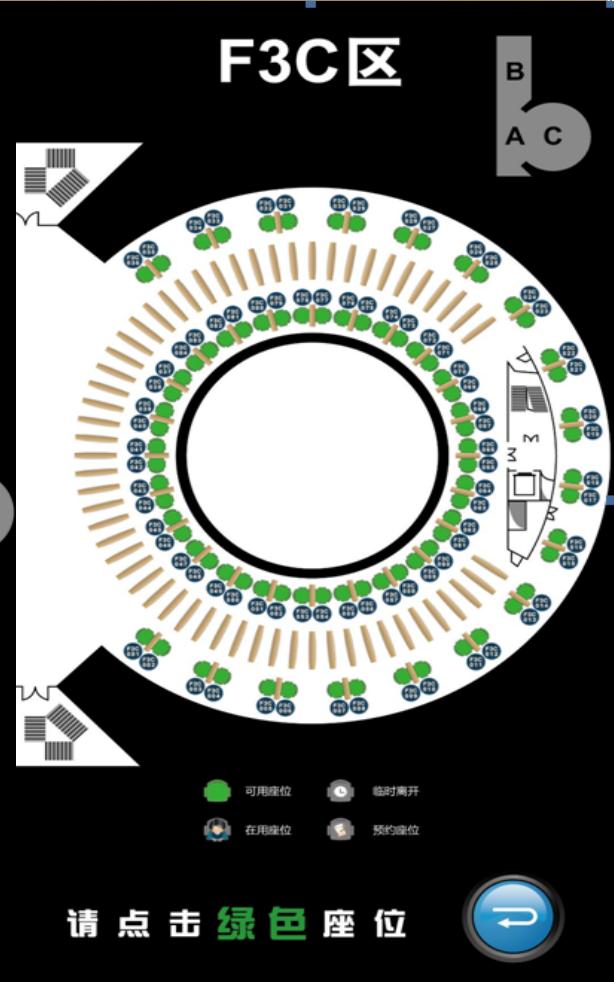
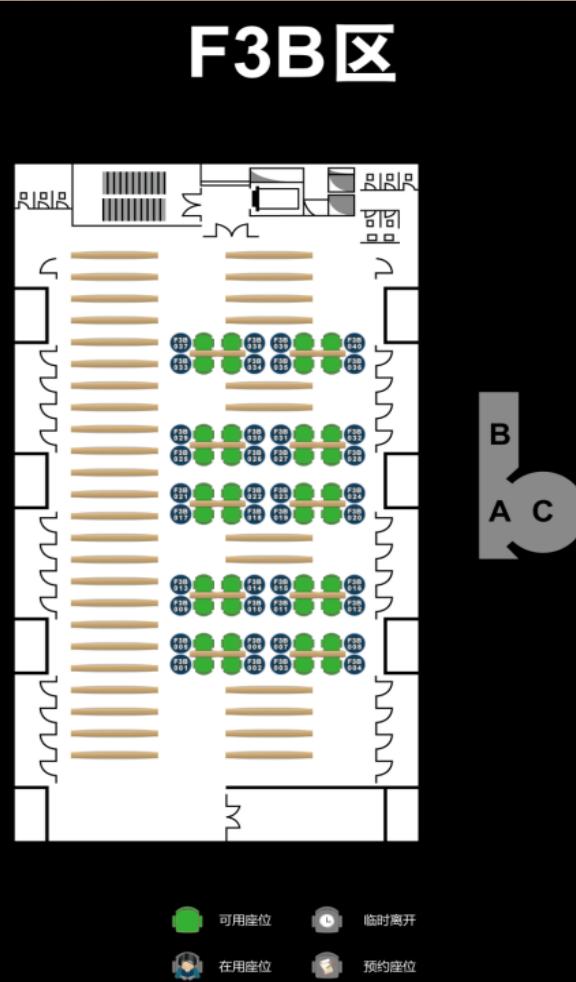
A yellow arrow points from the bottom left towards the QR code area. Another yellow arrow points from the bottom right towards the text '或者您的手机具有拍照功能, 并且安装微信或其他二维码识别软件 (如QuickMark), 可用手机扫描右边的书目二维码, 直接获得信息, 无需等待!'.

或者您的手机具有拍照功能, 并且安装微信或其他二维码识别软件 (如QuickMark), 可用手机扫描右边的书目二维码, 直接获得信息, 无需等待!

# 研读间及座位的预约提醒服务

Appointment reminder service for research carrels and seat

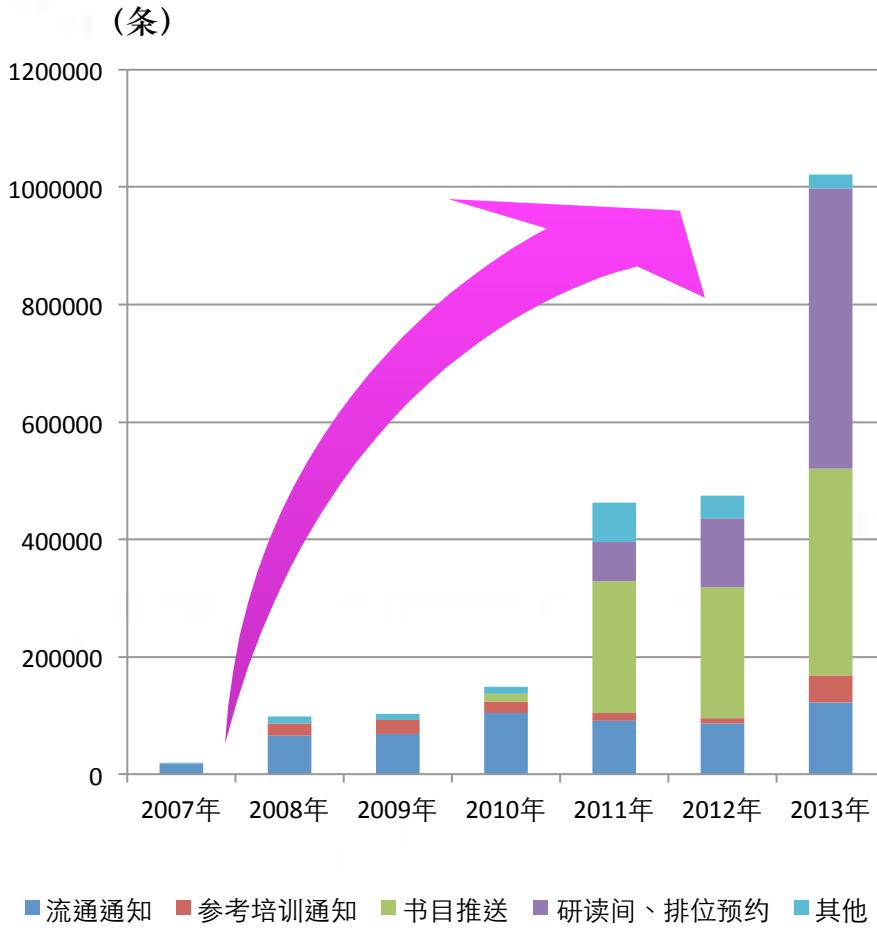
自助座位管理的预约、选位等提醒（文科馆座位）



## The amount of readers who register phones number in the library system



## 短信发送量 SMS statistics



- 至2013年底，注册图书馆短信服务用户近3万人

By the end of 2013, the amount of users who register library SMS service is 30,000.

- 7年期间累计发送各类短信超过260万条

Within 7 years, the accumulated amount of issued SMS is over 2.6 million.

# 清华大学移动图书馆网站的发展

## The development of Tsinghua mobile library website



2013年移动图书馆总访问量126.7万，检索量10.5万，全文浏览下载10.2万。  
In 2013, the total amount of visits of mobile library is more than 1.26 million, the amount of retrieval is 105 thousands, the amount of browse and download of full text is 102 thousands.

# 图书馆OPAC查询和馆藏地图

## Library OPAC query and collections map

The collage consists of five overlapping screenshots:

- Leftmost Screenshot:** A mobile browser interface showing search results for "与方法; 图书及文献; 检方法; 参考工具". It includes links for "馆藏地点" (Collection Location) and "发送到手机" (Send to Phone). The URL is [ogmap.lib.tsinghua.edu.cn/](http://ogmap.lib.tsinghua.edu.cn/).
- Middle Left Screenshot:** A mobile browser interface showing a collection location map for Tsinghua University Library. It displays various building icons and a green area labeled "人文社科" (Humanities and Social Sciences). A red location pin is placed on the map.
- Middle Screenshot:** A mobile application interface for "清华大学图书馆" (Tsinghua University Library). It shows a list of collection locations with checkboxes and details like "G250 G865C3". Buttons include "发送到手机" (Send to Phone), "预约选择的记录" (Reserve selected records), and "图" (Image).
- Right Screenshot:** A mobile application interface showing a successful login confirmation. The phone number "106901162119" is displayed, along with a message: "认证成功, http://new.ddlib.com/c/349 92/197944 还可认证您的其它手机或上网设备。[移动图书馆]". The date "2012-8-29 18:31" is also shown.
- Bottom Right Screenshot:** A mobile application interface showing a detailed book record. It includes the title "书籍: 应用图书馆学教程", author "ying yong tu shu guan xue jiao cheng / 郭依群编著", collection location "文科馆图书借阅区", call number "G250 G865C3", and a note about it being a gift from the author. Buttons include "发送到手机" (Send to Phone), "转发" (Forward), and "删除" (Delete).

# 数字资源统一检索和对象链接与浏览

## Digital resources integration retrieval and object linking and browsing

The screenshots illustrate the integration of digital resources and mobile library services. The first four screens show the mobile library's main interface with options like '首页' (Home), '馆藏' (Collection), '全文' (Full Text), '按日期' (By Date), and various search and download functions. The fifth screen shows a detailed article about QR codes, with specific sections highlighted by red boxes: '二维条码在移动图书馆服务拓展中的应用探索' (Exploration of QR code application in mobile library service expansion), '张蓓 张成昱 姜爱蓉 窦天芳' (Zhang Bei, Zhang Chengyu, Jiang Aierong, Dou Tianfang), and '的正方图案为定位图案, 用来帮助软件确定QR码的位置、尺寸和倾斜度' (The square pattern is a positioning pattern, used to help software determine the position, size, and angle of the QR code). The sixth screen displays a diagram of a QR code with labels: '定位用图案 Position detection patterns', '资料储存区 Data area', and '组成单元 Module'. The bottom right corner of the sixth screen shows a purple box labeled '图文混排格式' (Text and Image Mix Layout Format) and a small icon with the number '6'.

二维条码在移动图书馆服务拓展中的应用探索  
张蓓 张成昱 姜爱蓉 窦天芳  
的正方图案为定位图案, 用来帮助软件确定QR码的位置、尺寸和倾斜度

[8] :

定位用图案 Position detection patterns  
资料储存区 Data area  
组成单元 Module

图 1 QR 码的组成

二维条码并不是一项新技术, 但是过去因读取设备所限, 未能得到普遍应用。而伴随相关技术的进步, 二维条码迎来了更多的机遇。目前手机上应

图文混排格式 6

# 图书馆迎新活动中的二维码应用

## Application of the two-dimensional code In Library orientation



The image shows the front cover of the "Guide Book of Tsinghua University Library 2012". The cover is pink and features the title in English ("VE YOUR BRARY LIBRARY", "DEINER BIBLIOTHEK", "OUR LIBRARY", "votre bibliothèque") and Chinese ("爱上图书馆"). Below the title is a large circular seal with the university's name in Chinese and English, and the year "1912". At the bottom, the website "http://www.lib.tsinghua.edu.cn" is printed. A QR code is overlaid on the right side of the cover, linking to the library's digital resources.

### 播放馆长寄语的音频

Play audio of library director speech by two-dimensional code



# 图书馆主页新生专栏的手机浏览

Freshman special column can be browsed by two-dimensional code

**14 移动图书馆**

移动图书馆提供短信、彩信、手机网站、客户端应用等多项服务，为读者提供便捷的信息平台。读者可以随时随时随地通过手机等各类移动设备使用图书馆的服务，及时获取图书馆信息和资源。包括：接收流通通知、订阅热门学术期刊最新文章彩信、馆藏书目的查询和预约、以及电子资源的检索、阅读等。

**短信服务**  
读者在无法通过电脑上网的情况下，可以使用手机短信查询个人的借阅信息，进行图书的查询、预约/取消预约和续借等操作。还可以在登记手机号码后接收到图书馆主动发布的各类信息短信（例如：馆藏到期提醒、预约取书、图书培训讲座通知等）。为了方便广大读者入库取书，读者查找图书时可自动推送书目短信。

**彩信服务**  
电子期刊最新信息彩信推送服务提供《清华大学学报（自然科学版）》、《Journal of power sources》等132种电子期刊的新文摘信息。读者经由无线移动数字图书馆系统(TWIMS)订阅感兴趣的刊物后可定期接收到包含最新文摘信息的彩信。

**手机网站**  
手机网站提供本馆资讯、馆藏目录查询、个人借阅信息（含在馆藏、预约记录和借阅历史）、借阅、馆藏预约的续借、电子资源检索和全文阅读、留言反馈等多个模块。网址：<http://mo.lib.tsinghua.edu.cn>。

**客户端应用**  
随着使用iPhone、Android手机的读者人数日益增多，图书馆着手开发手机客户端应用，方便读者随时使用图书馆的移动服务。相关应用已陆续推出，如图书馆已发布Android手机客户端。读者下载安装后使用借书证号/PIN码登录，可实现馆藏目录查询、个人借阅记录查询和检索数据库。

§ Android客户端应用登录界面

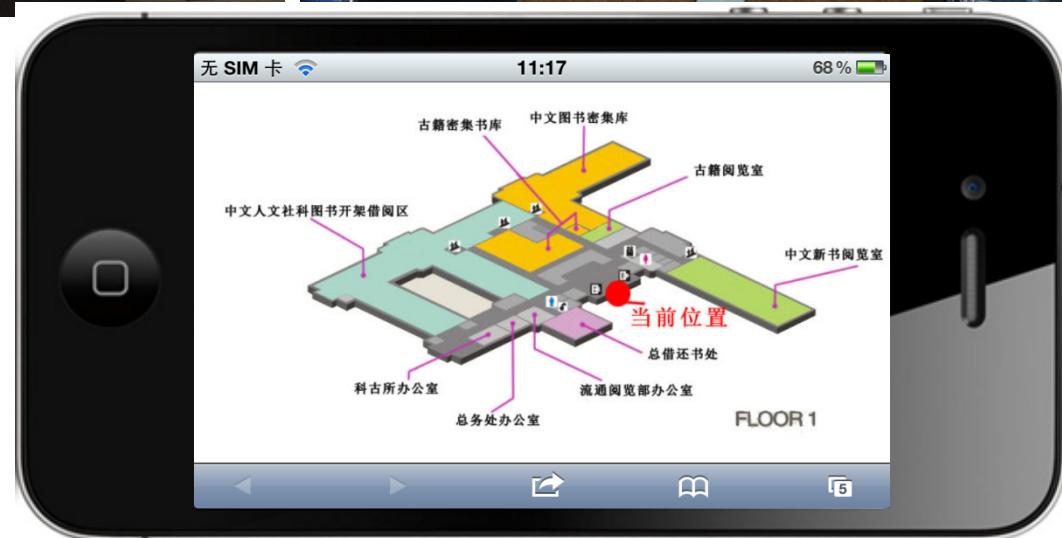
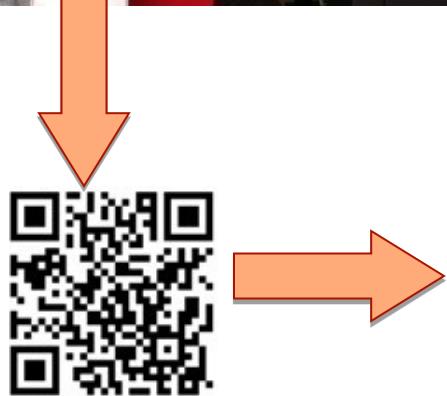
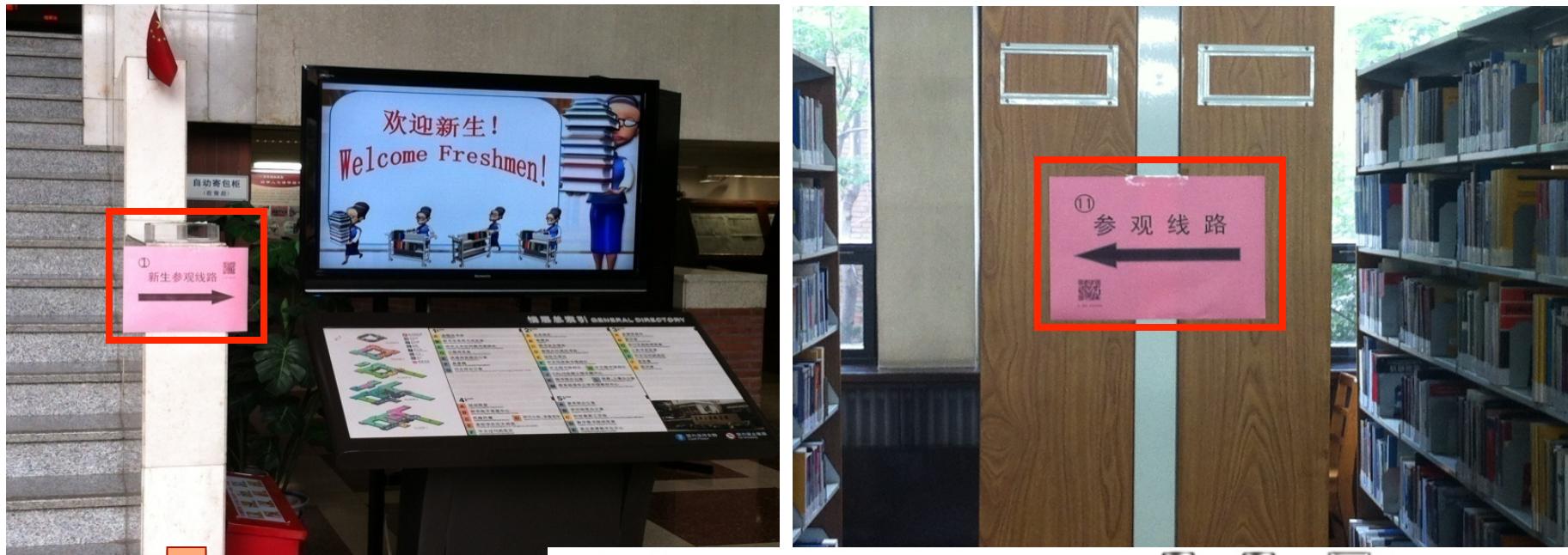
更多移动图书馆信息，请访问“图书馆主页—移动图书馆”。



读者手册封底印二维码

# 新生自助导览中查看馆舍地图

Layout map can be viewed by two-dimensional code in freshman library orientation



导览路线上的二维码路标

# 2013年发布清华图书馆微信

Tsinghua library's WeChat is released in 2013

Thu-lib



微信 | 公众平台 Beta

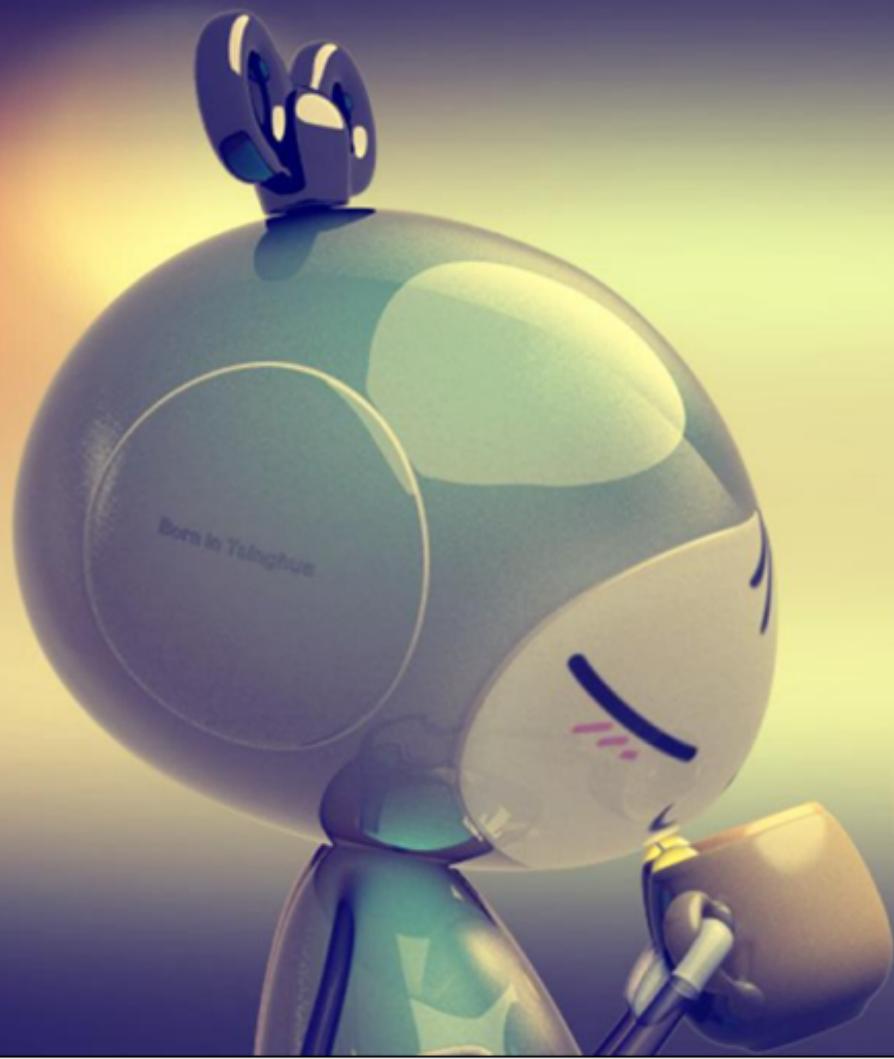
The screenshot shows the Tsinghua Library WeChat interface. On the left, there are several menu items: '水木华学可视' (Waterwood Hua Xue Visual), '学在清' (Studying at Tsinghua), '图书馆推' (Library Recommendation), and '清华藏珍' (Tsinghua Treasures). In the center, a yellow-bordered box highlights the '清图快生、新' (Quick Birth, New) post from September 2nd. To the right, a green-bordered box highlights the '清图快' (Quick) section, which includes '原创游' (Original Tour) and '清图' (Clear Image). Further right, a red-bordered box highlights a '培训' (Training) section with three items:

- 1. 讲座:EPS数据分析平台使用介绍(5月29日下午13:30)<http://lib.tsinghua.edu.cn/dra/news/course/5067>
- 2. 讲座:利用印象笔记管理个人知识(5月30日下午13:30)<http://lib.tsinghua.edu.cn/dra/news/course/5045>
- 讲座:Scopus及Reaxys数据库高级使用(5月30日上午9时)<http://lib.tsinghua.edu.cn/dra/news/course/5044>

At the bottom, a yellow box contains three statistics:

- 微信关注超**4439**人
- 推送清图微报**87**期
- 读者微信互动**11571**次

更多融入读者，便捷传播图书馆信息和提供服务，  
促进读者在社交网络环境里随时随地利用图书馆。



# 清华聊天机器人“小图”的移动应用

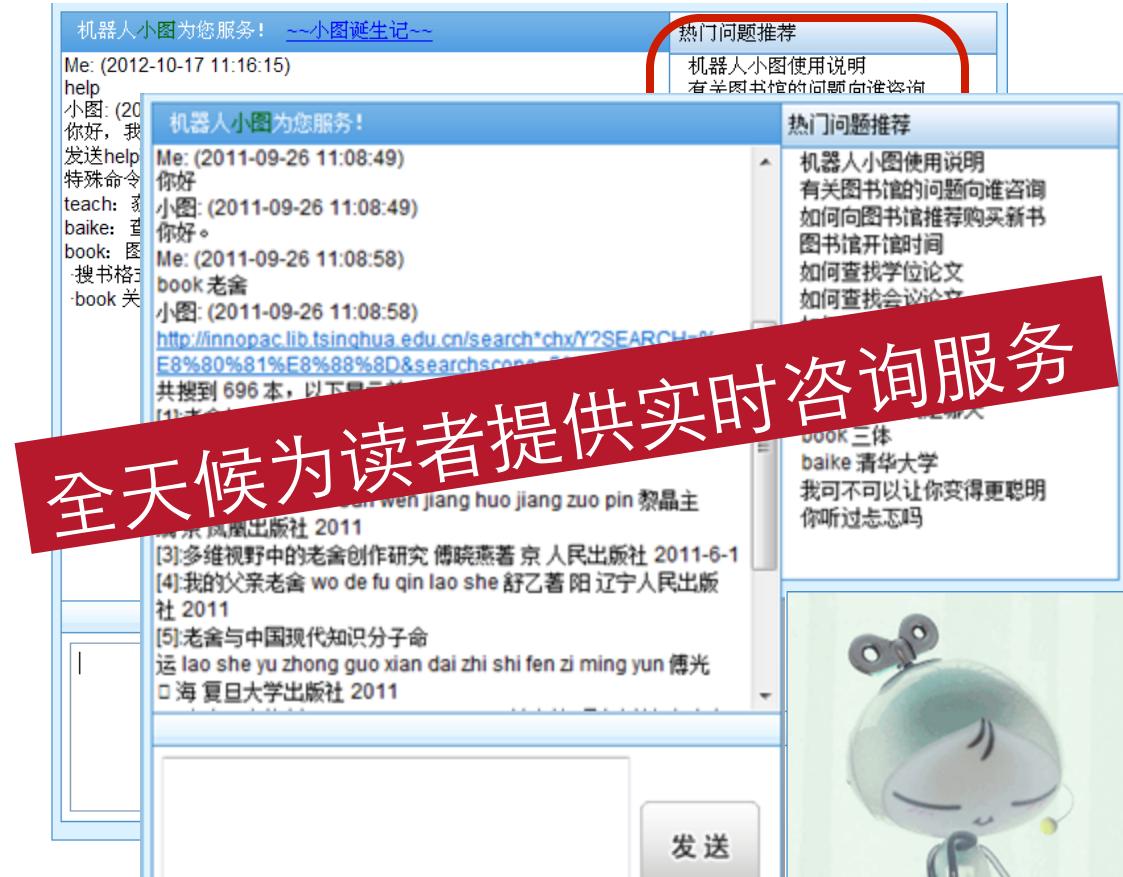
Mobile application in Tsinghua library: chat robot “xiao TU”

# 聊天机器人“小图”提供图书馆咨询服务

The chat robot “xiao TU” provides library reference service

## 智能聊天机器人功能

- ▶ 中文自然语言问答
- ▶ 图书馆FAQ回答
- ▶ 搜索图书功能
- ▶ 百科搜索功能
- ▶ 自学习功能
- ▶ 热点问题推荐
- ▶ 英语自然语言问答
- ▶ 社交网络整合



- 日最高访问人数超7000
- 受到年轻读者的欢迎；

- 多次接受校内外媒体采访
- 嵌入图书馆咨询服务界面

# 聊天机器人“小图”提供图书馆咨询

The chat robot “xiao TU” provides library reference service

机器人小图为您服务！

热门问题推荐

·搜书格式如  
·book 关键字

Me: (2012-06-21 01:54:50)  
你几岁了？  
小图: (2012-06-21 01:54:50)  
还是花季呢？  
Me: (2012-06-21 01:54:50)  
你是男还是女  
小图: (2012-06-21 01:54:50)  
我是外星人  
Me: (2012-06-21 01:54:50)  
你吃饭吗？  
小图: (2012-06-21 01:54:50)  
我是机器人，  
Me: (2012-06-21 01:54:50)  
你会法语吗？  
小图: (2012-06-21 01:54:50)  
会一点点 Bor  
Me: (2012-06-21 01:54:50)  
你知道胡适吗  
小图: (2012-06-21 01:54:50)  
被忽略的大师

机器人小图为您服务！

热门问题推荐

·搜书格式如  
·book 关键字

Me: (2012-06-21 01:54:50)  
how old are  
小图: (2012-06-21 01:54:50)  
I was active  
Me: (2012-06-21 01:54:50)  
Are you a girl  
小图: (2012-06-21 01:54:50)  
Man entity  
Me: (2012-06-21 01:54:50)  
Are you kid  
小图: (2012-06-21 01:54:50)  
Yes I am just  
Me: (2012-06-21 01:54:50)  
Can you sing  
小图: (2012-06-21 01:54:50)  
Yi diar. Ni hao  
Me: (2012-06-21 01:54:50)  
共找到 7 个结果  
[1]: 图本末  
出版社 2  
[2]: 书信也  
舍 shux  
大学出版 3  
[3]: 老舍与  
[4]: 第五届

读者喜爱小图的很大原因是因为她的可爱与萌、能即时掌握普通用户教她的大量网络语言。图书馆需要对这些临时语料库进行管理和清理，为保持小图俏皮、有趣的形象，在整理语料库时会尽量保留积极健康的网络语言。用户教小图的热情很高，她很受年轻读者欢迎，是图书馆最受欢迎的服务之一。

# 聊天机器人“小图”的系统架构

## The chat robot “xiao TU” system architecture



采用获奖3次的开源自然语言人工智能聊天机器人软件**ALICE**

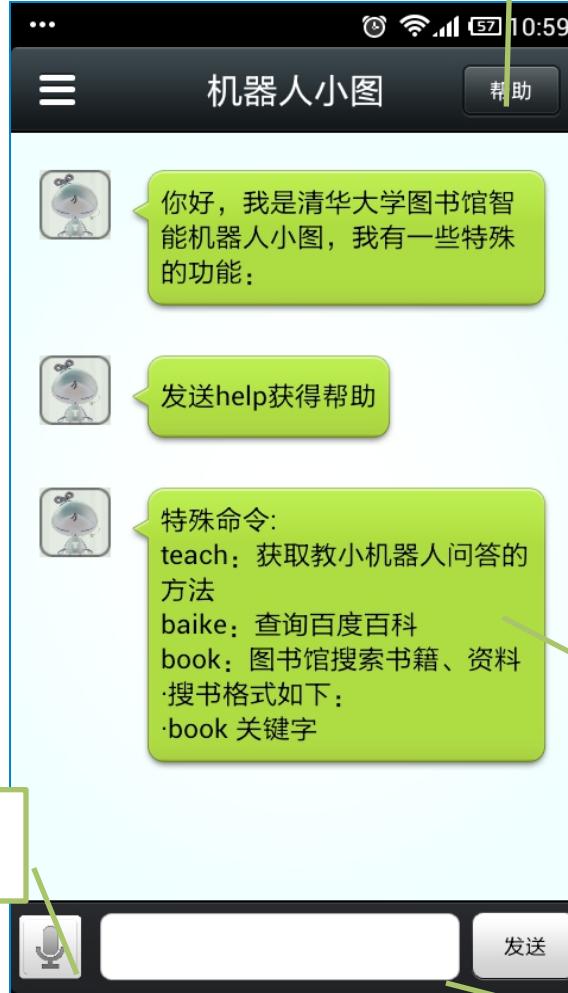
“Xiao TU” is based on ALICE, an open source software of natural language artificial intelligence chat robot, which won Loebner awards three times.

# 聊天机器人“小图”App

The chat robot "Xiao TU" Application



语音输入



帮助信息



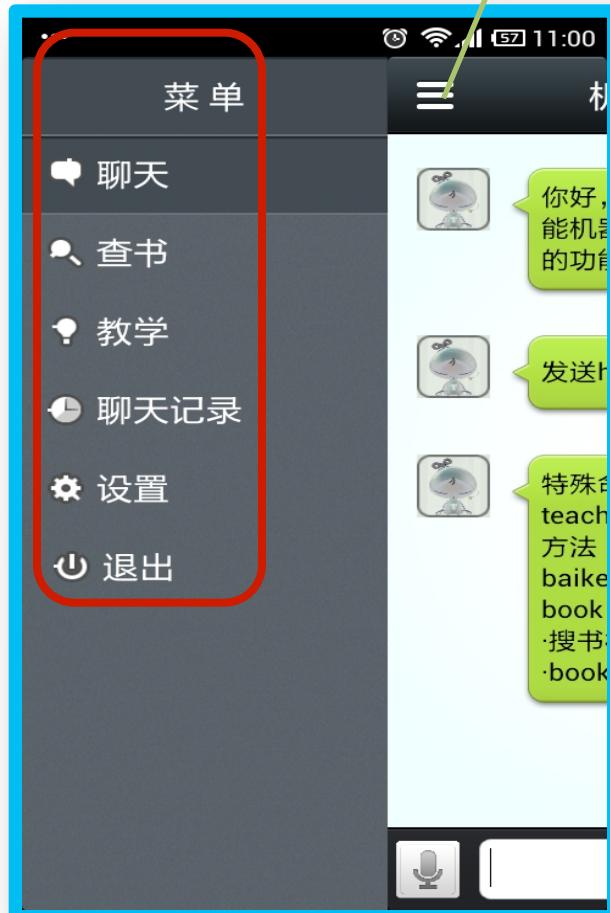
聊天

输入框

# 聊天机器人“小图”App

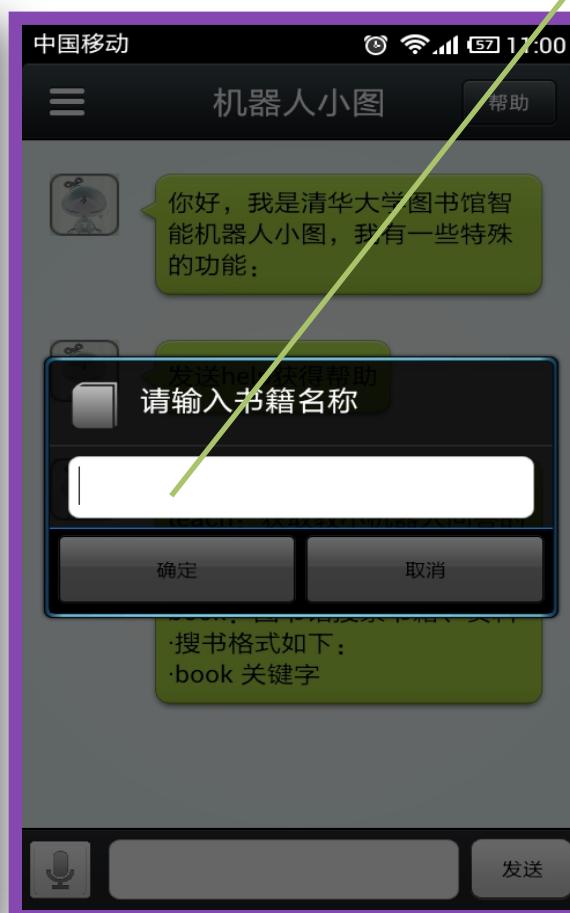
The chat robot "Xiao TU" Application

## 功能菜单 Menu



菜单按钮

## 图书搜索 Book Search



输入关键词



查询结果

# 微信一小图 The chat robot “Xiao TU” in WeChat



# 结语

Conclusion

# 移动图书馆的现状和未来发展

Current situation and future development of mobile library

- 移动互联网无处不在、随时在线的特征高度契合图书馆知识传播的本质功能。

The mobile Internet has ubiquitous communication characteristics that are highly fit with the knowledge dissemination, the core functionality of library.

- 移动技术正在促使 移动图书馆 由概念转变为现实。

Mobile Technologies make the "Mobile Library" from concept into reality.

- 移动图书馆的技术和服务还在初级阶段，很多不成熟尚需推动普及，如同十几年前的数字图书馆初期。

Technology and service of mobile library is still in early stages, they have many immature aspects and need promoting, same with the early stages of digital library more than ten years ago.

- 移动图书馆就像一颗火种，星星之火必将燎原。

Mobile library like a little spark , but from a little spark may burst a mighty flame.

# 移动图书馆面临着挑战和困难

The development of mobile library faces challenges and difficulties

■ 首先是移动图书馆与数字图书馆、实体图书馆的相互融合和相互促进。移动服务是图书馆整体服务体系中的一个有机组成部分，需要线上线下互动发展。

The first one is how to deal with blending and promotion among mobile library, digital library and physical library. The mobile service is an important part of the entire library service system, and it requires interaction between online and offline.

■ 移动服务的用户体验更为重要。移动互联网“通信便捷”、移动装置“小巧轻便”的特点对移动图书馆的稳定性和流畅性提出更高要求。

The second one is how to provide good user experience of mobile services. The mobile Internet makes communication very convenient and mobile devices are very intelligent and portable. All these features bring higher requirements for the stability and fluency of the mobile library.

# 移动图书馆发展面临着挑战和困难

The development of mobile library faces challenges and difficulties

■ 图书馆需要挖掘和发挥移动装置特有的功能和特点，创建适应读者需求的新型服务，提高图书馆与读者的粘合度。

The third challenge is how to make good use of advantages of mobile devices, like motion sensing and locating features, so that we can create new type of services that can enhance the adhesion between libraries and readers.

■ 移动技术不断推动图书馆的创新发展，支持图书馆用新的理念和手段创造性地传递图书馆资源和服务。

The mobile technology will continuously promote the innovative development of libraries, support libraries to deliver resources and services creatively using new concepts and approaches.

# THANKS...

# 谢谢！



欢迎交流：[jiangar@lib.tsinghua.edu.cn](mailto:jiangar@lib.tsinghua.edu.cn)